

REMARKS/ARGUMENTS

Review and reconsideration of the Office Action dated November 3, 2004, is respectfully requested in view of the above amendments and the following remarks.

The pending claims are Claims 1-19.

The specification has been amended to address the Examiner's objection with respect to a grammatical error at page 11.

Claims 7, 9, 10 and 14 have been amended to overcome the Examiner's rejection under 35 U.S.C. § 112, second paragraph.

Claim 1 has been amended and claim 20 has been added to overcome the Examiner's rejection under 35 U.S.C. § 102(b).

As an additional consequence of the amendment to claim 1, the Examiner's rejection under 35 U.S.C. § 103(a) has been addressed.

Office Action

Turning to the Office Action, the paragraphing of the Examiner is adopted.

Specification

The Examiner has objected to the specification allegedly because a grammatical error at page 11, paragraph [00051], line 3.

In response, Applicants have amended paragraph [00051] to correct the grammatical error.

Therefore, Applicants respectfully submit that the defect in the specification noted by the Examiner has been corrected. Therefore, Applicants respectfully request the withdrawal of the objection to the specification.

Claims Rejections - 35 USC § 112, second paragraph

The Examiner has rejected claims 1-19 under 35 U.S.C. 112, second paragraph, as being allegedly indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Specifically, the Examiner indicates that:

- A. There is no antecedent in the base claim to support the recitation "the reagents" in claim 7.
- B. Claim 9 is indefinite since the base claim does not recite for identification and/or quantification step.
- C. There is no antecedent in the base claim to support the recitation "the loading solution" in claim 10.

In addition, the Examiner also indicates that the term "amorphous gas" recited in claim 14 does not have support in the specification.

In response, Applicants have amended claim 7 to delete the term "reagents" and to indicate that the discrete regions in the micro-array contain distinct captured proteins.

Applicants have also amended claim 9 to indicate that the claimed method further comprises identifying and/or quantifying proteins.

Moreover, Applicants have amended claim 10 to replace the term "loading" with the term "spotting", which has the proper antecedent in the base claim.

Furthermore, Applicants have amended claim 14 to replace the term "amorphous gas" with the terms "an atmosphere of inert gas", which have proper support in the specification at page 9, paragraph [00045], line 2. Applicants respectfully submit that no new matter has been added.

In view of the amendments to claims 7, 9, 10 and 14, Applicants respectfully submit that these claims are not indefinite under 35 U.S.C. § 112, second paragraph. Therefore, Applicants respectfully request the Examiner to withdraw the rejection to claims 1-19 under 35 U.S.C. § 112, second paragraph.

Claim Rejections - 35 USC 102 § 102

The Examiner has rejected claims 1-3, 5-9, 12-13 and 15 under 35 U.S.C. 102(b) as being anticipated by MacBeath et al. (US 2002/0102617). The Examiner contends that MacBeath discloses at [0006] a method for microarraying and/or immobilizing proteins on a solid support and identifying proteins, wherein the proteins to be arrayed are provided in a buffered aqueous solution containing glycerol or polyethylene

glycol as humectants to prevent evaporation of the nanodroplets. The Examiner also indicates that according to MacBeath, humectants or polymers (e.g., polyethylene glycol, glycerin, maltitol, polydextrose, sorbitol, cetyl alcohol, fatty alcohols, propylene glycol) other than glycerol may be used to prevent evaporation. The remaining details of the Examiner's position can be found in pages 4-6 of the Office Action.

In response Applicants have amended claim 1 to indicate that the concentration of the polyol in the spotting solution is between 0.5 and 10%. Support for the amendment of claim 1 can be found in the specification at paragraph [00041].

In addition, Applicants have added claim 20 which recited that the spotting solution used in the claimed method also comprises between 0.001 and 0.5% of azide or between 1 and 100mM of borate. Accordingly, Applicants have also amended claim 18 to provide proper antecedents for the terms recited in new claim 20. Proper support for claim 20 can be found in paragraph [00042] of the specification. Applicants respectfully submit that no new matter has been added.

Applicants respectfully submit that MacBeath, in paragraph 0046, teaches the prevention of evaporation of nanodroplets with protein by using 40% glycerol or other humectants, e.g., maltitol, sorbitol, etc.

However, as the Examiner pointed out in the second paragraph of page 7, MacBeath does not teach that the polyol

solution is between 1 and 5%, or 0.5 to 10%, as it is presented in the amended claim 1 or described in paragraph [00041] of the Applicants' specification.

Moreover, MacBeath does not disclose either a drying step as it is described in the specification at paragraphs [00012] and [00057]. In contrast, the high concentration of humectants taught in MacBeath, requires a washing step by rinsing with ethanol before storage (see MacBeath at paragraphs 0071 and 0077), otherwise, the high concentrations of the humectants would prevent the removal of humidity and just leave an oily film in the support.

Furthermore, MacBeath teaches a protein array which preserve protein activity for up to two months (see MacBeath at paragraph 0077). In contrast, our invention discloses a protein array in which the protein activity is preserved for 6 months, as it is indicated in claim 17 of the application.

Thus, Applicants respectfully submit that, according to MacBeath, for the skilled artisan it was unexpected to preserve the activity of the protein in the micro-arrays at such low concentrations of polyols for six months. MacBeath teaches away from using such low concentrations of humectants.

Applicants respectfully submit, also, that MacBeth does not teach either that the aqueous solution with the polyols contains azide (between 0.001 and 0.5%, preferably between 0.05 and 0.2%) or borate (between 1 and 100mM, preferably between 25 and 75 mM)

as anti-bacterial agents.

Consequently, Applicants respectfully submit that MacBeath does not anticipates claims 1-3, 5-9, 12-13 and 15 under 35 U.S.C. 102(b). Therefore, Applicants respectfully request the Examiner to withdraw the rejection to claims 1-3, 5-9, 12-13 and 15 under 35 U.S.C. 102(b).

Claim Rejections - 35 USC § 103

The Examiner has rejected Claim 19 under 35 U.S.C. 103(a) as allegedly being unpatentable over MacBeath in view of U.S. Patent 6,686,151 to Lazar et al.

The Examiner contends that Lazar discloses a kit to detect and measure biological molecules that is simple to use, highly specific, sensitive, and accurate for screening a plurality of biological molecules. Thus, the Examiner asserts that it would have been obvious for the skilled artisan, at the time the invention was made, to have been motivated to form the Micro-array of MacBeath into a kit as taught by Lazar.

Applicants respectfully submit that because MacBeath teaches 40% glycerol as humectant, and no drying step, for the skilled artisan, it was unexpected to preserve the activity of proteins in micro-arrays at low concentrations of polyols for six months.

Thus, MacBeath teaches away from using low concentrations of humectants or a drying step. Then, for the skilled artisan,

it would not have been obvious to combine MacBeath and Lazar. Consequently, MacBeath and Lazar does not make the instant invention, as presented in claim 19, unpatentable under 35 U.S.C. § 1039(a).

Therefore, Applicants respectfully request the Examiner to withdraw the rejection to claim 19 under 35 U.S.C. § 1039(a).

The second paragraph in page 7 of the office action is not clear. Therefore, we contacted the Examiner by phone. The Examiner explained that he mistakenly omitted the heading of an obviousness rejection to claims 4, 10, 11, and 16 to 18. The Examiner indicated that he had rejected these claims under 35 U.S.C. 103(a) as being unpatentable over MacBeath in view of published application US 2003/0127333 by Lauks, and U.S. patent 6,656,700 to Gu. The Examiner further noted that the second paragraph of page 7 and the first paragraph of page 8 of the office action apply to the rejection under MacBeath, Lauks and Gu.

The Examiner contends that Lauks describes sorbitol that can be added in 20 % by weight. The Examiner also indicates that Gu discloses that D-enantiomers of peptides are more resistant to proteolytic attack. Accordingly, the Examiner asserts that it would have been obvious to the skilled artisan, at the time the invention was made, to use 1-5% polyol depending upon the polyol used.

Applicants respectfully submit that neither MacBeath nor

Lauks nor Gu teaches a concentration of 1-5% polyol as humectant.

Moreover, Lauks teaches a 20% concentration of sorbitol which is above any of the humectant concentrations we disclose in the instant application. Additionally, Lauks, in paragraph 0151, teaches that 20% sorbitol was used to reduce the time for water uptake to increase conductivity in a solid-phase hydrophilic matrix circuit to improve the conditions for an immediate reaction to take place in said solid-phase matrix. Lauks does not teach methods steps in the preparation of a micro-array or the use of polyols in a spotting solution. Lauks does not motivate using sorbitol to preserve the activity of a protein in a microarray for six months. Therefore, Lauks could not suggest using the low concentrations of polyols disclosed in the present application.

Gu does not teach at all the use of polyols to preserve the activity of proteins in a microarray.

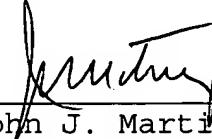
Thus, Applicants respectfully submit that MacBeath, Lauks and Gu does not make unpatentable claims 4, 10, 11, and 16 to 18, under U.S.C. 103(a). Therefore, Applicants respectfully request the Examiner to withdraw the rejection to claims 4, 10, 11, and 16 to 18, under U.S.C. 103(a).

Applicants believe that all the claims are now allowable. Favorable consideration and early issuance of the Notice of Allowance are respectfully requested. Should further issues

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remain prior to allowance, the Examiner is respectfully requested to contact the undersigned at the indicated telephone number.

Respectfully submitted,


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